CHAPTER 3

INSPECTION

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3.1 DEFINITIONS

Whole Dry Beans. Beans shall be dry threshed field and garden beans, whole, broken, and split, commonly used for edible purposes.

Beans shall be divided into classes as follows, each of which, except Mixed beans, may contain not more than 2.0 percent of beans of contrasting classes and not more than 15.0 percent of beans of other classes that blend:

a. *PEA BEANS (THE TYPE AS GROWN IN THE GREAT LAKES REGION, KNOWN ALSO AS NAVY BEANS).* Seeds that are small, oval, quite plump, ends abruptly rounded, and white in color, through which shows numerous gray, vein-like markings over the entire surface.

b. *BLACKEYE BEANS (COWPEAS OF THE BLACKEYE VARIETY).* Cowpeas of the Browneye and Violeteye types shall also be considered as Blackeye beans. Seeds that are medium, slightly flattened, skin wrinkled, and white in color with large black, brown, or violet spots surrounding the eye.

c. *CRANBERRY BEANS (KNOWN ALSO AS SPECKLED CRANBERRY AND HORTICULTURAL POLE).* Seeds that are medium large, very broad, oval, exceedingly plump, ends uniformly but abruptly rounded, and light buff in color, sparingly splashed and streaked with dark red over entire surface and marked with a moderate wide, deep, orange eye ring.

d. *YELLOWEYE BEANS.* Seeds that are medium large to large, slightly less than 5/8 of an inch long, proportionately broad, plump, width ½ of the length, round at each end, straight at eye, and clear opaque white in color, outside the eye, with a large eye pattern that should cover about 1/4 the area.

e. *PINTO BEANS (INCLUDING THE MEXICAN PINTO TYPE, BUT NOT THE TYPE KNOWN AS SPOTTED RED MEXICAN).* Seeds that are medium large, somewhat flattened, and light brown in color, tinted salmon with narrow curved streaks of darker brown or mahogany red.

f. *MARROW BEANS (NOT INCLUDING RED MARROW).* Seeds that are rather large, short, quite plump, ovate, with fully rounded ends, and white in color.

g. *GREAT NORTHERN BEANS*. Seeds that are intermediate to large, rather lengthened in size and shape, and similar to, but smaller and flatter than white kidney beans, and white in color.

h. *SMALL WHITE BEANS (THE TYPE AS GROWN ON THE PACIFIC COAST, NOT INCLUDING TEPARY BEANS)*. Seeds that are small, shape somewhat triangular, flattened, one end somewhat larger and broader than the other, both ends rounded but the small end more abruptly, and white in color.

i. *FLAT SMALL WHITE BEANS (THE TYPE AS GROWN IN NORTHERN IDAHO)*. Seeds that are slightly larger than small white beans, but distinctly flattened in shape.

j. *WHITE KIDNEY BEANS*. Seeds that are large, oblong to kidney shaped, fairly plump to somewhat flattened, ends rounded, white to slightly creamy in color (especially about the eye), and distinctly veined.

k. *LIGHT RED KIDNEY BEANS (INCLUDING THE TYPE GROWN ON THE PACIFIC COAST)*. Seeds that are medium to large, long, broad, somewhat kidney shaped, may be rather flattened, ends rounded, and light to reddish brown in color.

l. *DARK RED KIDNEY BEANS*. Seeds that are large, oblong to kidney shaped, somewhat flattened, ends rounded, eye small, flat, and dark red in color.

m. *SMALL RED BEANS (KNOWN ALSO AS RED MEXICAN, CALIFORNIA RED, AND IDAHO RED)*. Seeds that are small, very broad, oval, reddish purple in color over the entire surface, and marked with a very narrow, black eye ring.

n. *PINK BEANS*. Seeds that are medium-sized, thin, and light salmon pink in color with rather obscure light brown eye ring.

o. *BLACK BEANS*. Seeds that are small, oval to rectangular in shape, and black in color with white eye.

p. *MUNG BEANS*. Seeds that are very small, oblong, blunt ends, olive green to dark green in color, and occasionally marbled with black, yellow, or brown. (Note: Chinese Red beans are “mung type” beans and are similar in shape but slightly larger and red in color.)

q. *MISCELLANEOUS BEANS. BEANS THAT ARE NOT OTHERWISE CLASSIFIED IN THESE STANDARDS SHALL BE CLASSIFIED AND DESIGNATED ACCORDING TO THE COMMONLY ACCEPTED COMMERCIAL NAME OF SUCH BEANS*. Cowpeas of types other than Blackeye, Browneye, and Violeteye shall be considered as Miscellaneous beans.

r. *LARGE LIMA BEANS (CHARACTERISTIC OF THE LARGE WHITE POLE AND BURPEE BUSH LIMA TYPE).* Seeds that are large, broad, oblong, fairly plump, ends rounded, and pale creamy white to greenish white in color.

s. *BABY LIMA BEANS (CHARACTERISTIC OF SMALL WHITE LIMA BEANS OF THE HENDERSON BUSH AND SIMILAR TYPES).* Seeds that are small, short, broad, somewhat triangular, flattened, surface somewhat wrinkled, one end usually broader and more gradually rounded than the other, and pale creamy white in color.

t. *MISCELLANEOUS LIMA BEANS. LIMA BEANS THAT DO NOT COME WITHIN THE CLASSES LARGE LIMA OR BABY LIMA SHALL BE CLASSIFIED AND DESIGNATED ACCORDING TO THEIR COMMONLY ACCEPTED COMMERCIAL NAME.*

(1) Florida Butter Speckled Lima Beans. Seeds that are small and similar in shape to Baby Lima beans, but are light buff blotched and irregularly spotted with reddish brown, deep maroon, or nearly black over one end and a portion of the sides, hilar and dorsal surfaces.

(2) Fordhook Lima Beans. Seeds that are similar in size, shape, and color to Large Lima beans except that the seeds are very thick towards one end.

(3) Jackson Wonder Lima Beans. Seeds that are similar in size and shape to Baby Lima beans but are reddish brown and covered with dark streaks on all sides.

(4) Thorogreen Lima Beans. Seeds that are similar in size and shape to Baby Lima beans, but the seedcoats are mostly light green to slightly green in color with not more than 20.0 percent of white seeds; however, the cotyledons are from slightly green to light green in color.

u. *MIXED BEANS. MIXED BEANS SHALL BE ANY MIXTURE OF BEANS NOT PROVIDED FOR IN THE CLASSES LISTED ABOVE.*

3.2 GRADES AND GRADE REQUIREMENTS

a. The grades and grade requirements for all classes of beans, except Mixed beans, are shown in the United States Standards for Beans (sections 132 - 140) and in the Attachment, "Grades and Grade Requirements for Beans," to this chapter.

NOTE: Field-run beans (i.e., dry beans from which the dockage has not been removed) are usually inspected for factors only, without reference to grade. The factor designation for field-run beans may include the percentage of dockage and type of sieve used in making the determination; the percent-age of total defects (including the percentage of splits, damaged beans, contrasting classes, and foreign material); and the percentage of moisture.

b. Grade Mixed beans according to the grade requirements of the class of beans which predominates in the mixture. Disregard the factors of contrasting classes and classes that blend in Mixed beans.

3.3 SPECIAL GRADES AND SPECIAL GRADE REQUIREMENTS

a. The special grades and special grade requirements of all classes of beans are shown in the United States Standards for Beans (section 142).

b. A special grade, when applicable, is supplemental to the grade assigned. Such special grades for beans are defined as follows:

(1) High Moisture. Beans that contain over 18.0 percent moisture.

(2) Off-color. Beans that, after removal of total defects, are distinctly off-color due to age or other natural causes but are not materially weathered.

(3) Prime Handpicked. Pea beans that are generally better in quality than U.S. No. 1.

(4) Choice Handpicked. Pea beans that are better in quality than U.S. No. 1 and Prime Handpicked.

3.4 WORK RECORD

Record the results of all tests and findings clearly and accurately on a laboratory ticket or similar form. This will be used as the source of the information reported on the inspection certificate. FGIS personnel shall use form FGIS-933, "Bean Sample Ticket."

3.5 REPRESENTATIVE PORTION

A specified quantity of beans divided out from the representative sample by means of an FGIS-approved device.

3.6 WORK SAMPLE

A representative portion of beans (approximate size - 1,000 grams) that is used to make all such determinations required for a particular class of beans.

3.7 FILE SAMPLE

a. A representative portion of beans (approximate size - 1,000 grams) that may be used in conjunction with the work sample, when needed. File samples may also be used for monitoring, retest, and appeal inspection purposes.

b. Retain file samples in appropriate containers for the required retention period. After maintaining for the required period, dispose of the file samples in accordance with established procedures. See FGIS Directive 9170.13, "Uniform File Sample Retention System," for additional information.

3.8 PERCENTAGES

All percentages shall be determined upon the basis of weight and shall be stated in terms of whole, tenths, and hundredths of a percent as required for individual factors.

a. Percentages are determined on the basis of weight and are rounded as follows:

(1) When the figure to be rounded is followed by a figure greater than or equal to 5, round to the next higher figure; e.g., report 6.36 as 6.4, 0.35 as 0.4, and 2.45 as 2.5.

(2) When the figure to be rounded is followed by a figure less than 5, retain the figure; e.g., report 8.34 as 8.3 and 1.22 as 1.2.

b. All percentages, except foreign material, stones, and contrasting classes in Choice Handpicked and Prime Handpicked Pea beans, are stated in whole and tenth percent to the nearest tenth percent. Foreign material, stones, and contrasting classes in Choice Handpicked and Prime Handpicked Pea beans are stated to the nearest hundredth percent.

3.9 LABORATORY SCALES

Weigh samples and portions of samples using the proper class of FGIS-approved laboratory scales, and record the results to the correct division size. Use the following table to determine the scale class and division size required for weighing particular sized samples.

Table 1 - Laboratory Scales

Position Size	Scale Class	Maximum Division Size	Record Results to at Least the Nearest--
120 grams or less	Precision	0.01 gram	0.01 gram
Samples for moisture determinations	Precision or Moisture	0.1 gram	0.1 gram
More than 120 grams	Precision, Moisture, or General	1 gram	1 gram

NOTE: See Chapter 2 of the Equipment Handbook for additional information.

3.10 PRELIMINARY EXAMINATION

a. The sampler must observe the uniformity of the beans as to class, quality, and condition; make the determination for “Heating;” draw the representative sample and report relevant information to the inspector.

b. The inspector must review the sampler's remarks/information. If the inspector has questions or doubts the representativeness of the sample, he or she must contact the sampler and obtain the needed information or make arrangements to obtain another sample.

3.11 BASIS OF DETERMINATION

The determination of "color" including "off-color" shall be upon the basis of the beans after the removal of defects. All other determinations shall be upon the basis of the beans as a whole.

NOTE 1: When beans that are offered for inspection as one lot are found to contain more than 10,000 containers or 1,000,000 pounds (bulk) of beans, the lot must be sampled on the basis of two or more (approximately) equal-sized sublots of 10,000 containers or 1,000,000 pounds or less. Inspect each sublot separately.

NOTE 2: When beans that are offered for inspection as one lot are subsequently found to contain portions that are distinctly different in class, quality, or condition, the beans in each portion shall be inspected separately.

Follow a systematic factor examination procedure. The order of procedure may vary depending on the class and quality of the beans and the tests that are requested. A general order of procedure is as follows:

(1) Review the information on the sample ticket.

(2) Examine the representative sample for odor and distinctly low quality.

(3) Use an FGIS-approved divider to process the representative sample into three representative portions: a work sample, a file sample, and a moisture sample.

NOTE: For specific information on the operation and maintenance of dividers, see Chapter 7 of the Equipment Handbook.

(4) (Field-run only) Remove the dockage from the work sample.

(5) Examine the work sample for: animal filth, broken glass, insect webbing and filth, live insects, materially weathered beans, metal fragments, not well screened beans, and unknown foreign substances.

(6) Upon request or when deemed necessary, determine the percent of moisture.

(7) Divide out a 500-gram representative portion from the work sample and examine it for all grade-determining factors, except damaged beans.

(8) Divide out a representative portion and examine for damaged beans.

Large Lima, Baby Lima, Miscellaneous Lima, Dark Red Kidney, Light Red Kidney, Marrow, Mixed, Pea, and White Kidney beans, examine 500 grams.

Cranberry, Great Northern, Pinto, and Small Red beans, examine 375 grams.

Blackeye, Black, Flat Small White, Pink, Small White, and Yelloweye beans, examine 250 grams.

Mung beans, examine 50 grams.

Miscellaneous beans, examine the same amount as is required for a class of beans of similar size and shape.

(9) After removing the total defects from the work sample, examine it for off-color.

3.12 INSECT INFESTATION (WEEVILY)

NOTE: "Weevils" shall include pea weevils, coffee bean weevils, broad nosed grain weevils, rice weevils, granary weevils, maize weevils, and lesser grain borers. "Other live insects" shall include beetles, moths, meal worms, and other insects injurious to stored beans.

a. Determine weevily on the basis of the work sample, representative sample as a whole, and the lot as a whole.

(1) Examine the work sample for live insects and clean-cut weevil-bored beans.

(a) If no live insects are found in the sample, make no further check for insects.

1 If two or more live insects are found, consider the beans to be weevily.

2 If one live insect is found, examine the file sample.

a If one or more live insects are found in the file sample, consider the beans to be weevily.

b If no live insects are found in the file sample, do not consider the beans to be weevily.

(b) If no clean-cut weevil-bored beans are found in the sample, make no further check for clean-cut weevil-bored beans.

1 In Mung beans, if more than 0.5 percent clean-cut weevil-bored beans are found consider the beans to be weevily.

2 In all other classes of beans:

a If two or more clean-cut weevil-bored beans are found, consider the beans to be weevily.

b If one clean-cut weevil-bored bean is found, examine the file sample.

i If one or more clean-cut weevil-bored beans are found in the file sample, consider the beans to be weevily.

ii If no clean-cut weevil-bored beans are found in the file sample, do not consider the beans to be weevily.

NOTE: If less than 1,000 grams is available, the presence of one clean-cut weevil-bored bean in a 500-gram representative portion shall be considered sufficient evidence that the beans are weevily.

(2) Examine the beans in the lot; i.e., the surface area of the lot and the area around the lot.

NOTE: The presence of weevils in a warehouse should not be considered an indication of infestation unless weevils are also found inside bags or containers of beans.

(a) If no live insects are found in, on, or about the lot, make no further check of the lot for insects.

(b) If two or more live insects are found, consider the beans to be "U.S. Sample grade."

b. When applicable, show "Weevily" on the work record and in the Remarks section of the certificate, and grade the beans "U.S. Sample grade."

3.13 MOISTURE

Moisture shall be determined by the use of equipment and procedures prescribed by the Federal Grain Inspection Service, U.S. Department of Agriculture, or determined by any method that gives equivalent results.

The special grade designation "High Moisture" is applicable to all classes of beans containing over 18.0 percent moisture.

a. Upon request or when deemed necessary, determine moisture on a representative portion of exactly 250 grams of beans.

NOTE: To determine the moisture content of Miscellaneous beans, use the moisture chart for the class of beans most similar in size and shape to the Miscellaneous beans in question. For Mung beans, use the Pea bean chart.

b. Refer to Chapter 5 of the Moisture Handbook for information about determining moisture using the Motomco Moisture Meter.

NOTE: If a representative portion of the original sample of beans was not placed in a moisture-proof container at the time of sampling, promptly do so upon arrival at the laboratory. Seal the container with a friction or screw-top lid to preserve the moisture. The use of open containers, paper containers, and similar containers for holding moisture samples is prohibited.

c. Record the percent of moisture on the work record and the certificate to the nearest tenth percent. If the moisture content exceeds 18.0 percent, grade the beans "High moisture."

3.14 CLASS

Beans shall be divided into classes as follows: Pea Beans, Blackeye Beans, Cranberry Beans, Yelloweye Beans, Pinto Beans, Marrow Beans, Great Northern Beans, Small White Beans, Flat Small White Beans, White Kidney Beans, Light Red Kidney Beans, Dark Red Kidney Beans, Small Red Beans, Pink Beans, Black Beans, Mung Beans, Miscellaneous Beans, Large Lima Beans, Baby Lima Beans, Miscellaneous Lima Beans, and Mixed Beans.

a. Class is usually determined by a cursory examination of the work sample as a whole.

b. When a detailed examination is necessary, determine class on a representative portion of approximately 500 grams. Use bean characteristics, including the color, size, and shape of the beans, when making this determination.

c. If the beans contain more than 2.0 percent contrasting classes or more than 15.0 percent classes that blend:

(1) Record the percent of each class on the work record to the nearest tenth percent,

(2) Grade the beans "Mixed beans," and record the percent of each class of bean, to the nearest tenth percent, in order of predominance, on the gradeline of the certificate.

3.15 ODOR

a. Determine odor on the basis of the representative sample as a whole.

(1) Off-odors (i.e., musty, sour, and commercially objectionable odor) are usually detected at the time of sampling.

(a) If there is any question as to the odor when the sample is being taken, a part of the sample shall be put into an airtight container to preserve its condition for further examination in the laboratory.

(b) Such portions shall be returned to the sample before the other tests are made.

(2) A musty odor shall be any odor that is earthy, moldy, and ground-like. Do not confuse a burlap bag odor with a musty odor.

(3) A sour odor shall be any odor that is rancid, sharp, or acrid.

(4) A commercially objectionable odor shall be any odor that is not normal to beans and that, because of its presence, renders the beans unfit for normal commercial usage (e.g., fertilizer, hides, oil products, skunk, smoke, fire-burnt, and decaying animal and vegetable matter odors).

(5) Fumigants or insecticide odors are not considered as commercially objectionable odors, unless they are caused by a fumigant or insecticide that does not dissipate quickly. When a sample of beans contains a fumigant or insecticide odor that prohibits a true odor determination, the following guidelines shall apply:

(a) The representative sample of beans shall be allowed to air out in an open metal container (e.g., a pan) for up to 4 hours; and

(b) If the fumigant or insecticide odor still prohibits the determination of the beans' true odor after 4 hours, the beans shall be considered as having a commercially objectionable odor.

b. When beans are determined to be musty, sour, or have a commercially objectionable odor, record the type of odor on the work record and in the Remarks section of the certificate, and grade the beans "U.S. Sample grade."

3.16 HEATING

a. Determine heating on the basis of the lot as a whole.

(1) When high temperatures develop in beans as the result of excessive respiration, such beans are heating.

(2) Heating beans usually give off a sour or musty odor.

(3) Care should be taken never to confuse beans that are warm due to storage in bins, cars, or other containers during hot weather with beans that are heating from excessive respiration.

b. When applicable, show the term "Heating" on the work record and in the Remarks section of the certificate, and grade the beans "U.S. Sample grade."

3.17 DOCKAGE

NOTE: This factor is not provided for under the United States Standards for Beans, but may be determined upon request.

a. Determine dockage on a representative portion of approximately 500 grams of field-run beans (1000 grams for Large Lima and Garbanzo beans). Dockage in field-run beans consist of small, underdeveloped dry beans, pieces of dry beans, and all matter other than dry beans which can be removed readily by the use of an FGIS-approved sieve.

b. Remove the dockage from the beans by sieving the representative portion with the appropriate-size sieve. For Mixed dry beans, use the sieve prescribed for the class of beans that predominates the mixture.

Table 2 - Prescribed Sieves

Classes	Sieves
Small-size Dry Beans	9/64" x 6/4" slotted-hole
Medium-size Dry Beans	10/64" x 6/4" slotted-hole
Large-size Dry Beans	11/64" x 6/4" slotted-hole
Large Garbanzo Beans	18/64" round-hole
Small Garbanzo Beans	16/64" round-hole
Miscellaneous Dry Beans	Use appropriate size sieve

(1) Nest the sieve on top of a bottom pan.

(2) Place the sieve in a mechanical grain sizer so that the slotted perforations are parallel to the motion of the sizer and set the timer to 20.

(3) Put one-half (one-third for Large Lima and Garbanzo beans) of the representative portion in the center of the sieve and actuate the sizer.

NOTE: If a mechanical sizer is unavailable, hold the sieves and bottom pan level and, using a steady motion, move the sieves from right to left approximately 10 inches, and return from left to right to complete one sieving operation. Repeat this operation 20 times.

(4) Return the material remaining in the perforations of the sieve to the portion that remains on top of the sieve.

(5) Consider all material that passed through the sieve as dockage. Pick out large material, such as pods and stems, from the beans remaining on top of the sieve and add it to the dockage.

(6) Remove the dockage from the remainder of the representative portion in the same manner.

c. Record the percent of dockage, with the size of sieve(s) used in the determination, on the work record and the certificate to the nearest tenth percent.

3.18 CONTRASTING CLASSES

Beans of other classes that are of a different color, size, or shape from the beans of the class designated.

a. Determine contrasting classes on a representative portion of approximately 500 grams. Use bean characteristics, including the color, size, and shape of the beans, when making this determination.

Table 2
Example of Contrasting Classes

Class	Contrasting Classes
Any class of white beans	Any class of another color
Small Red or Pink beans	Red Kidney beans
Blackeye, Cranberry, or Pinto beans	Any other class of beans
Large Lima or Baby Lima beans	Any other class of beans
Miscellaneous Lima beans	Any other class of beans
Small Red beans	Pink beans
Black beans	Any other class of beans

b. Except for Pea beans, record the percent of contrasting classes on the work record and the certificate to the nearest tenth percent. As a rule of thumb:

(1) For Pea beans that contain 0.05 percent of contrasting classes or more, record the percent of contrasting classes on the work record and the certificate to the nearest tenth percent.

(2) For Pea beans that contain less than 0.05 percent of contrasting classes, record the percent of contrasting classes on the work record and the certificate to the nearest hundredth percent.

c. When beans are determined to have more than 2.0 percent contrasting classes, grade the beans "Mixed beans" and record the percent of each class of bean, to the nearest tenth percent, in order of predominance, on the gradeline of the certificate.

3.19 CLASSES THAT BLEND

Sound beans of other classes that are similar in color, size, and shape to the beans of the class designated, and shall include white beans in the class Yelloweye which are similar in size and shape to the Yelloweye beans.

a. Determine classes that blend on a representative portion of approximately 500 grams. Use bean characteristics, including the color, size, and shape of the beans, when making this determination.

NOTE: Yelloweye beans in grades U.S. Nos. 1 and 2 may contain an additional 5.0 percent of classes that blend; provided that these "additional" beans are white beans of similar size and shape to Yelloweye beans.

Table 6
Example of Classes That Blend

Class	Classes That Blend
Pea Beans	Small White beans
Small White Beans	Flat Small White beans
Dark Red Kidney Beans	Light Red Kidney beans
Thorogreen Lima Beans	Baby Lima beans
Great Northern Beans	Marrow beans

b. Record the percent of classes that blend on the work record and the certificate to the nearest tenth percent.

c. When beans are determined to have more than 15.0 percent classes that blend, grade the beans "Mixed beans" and record the percent of each class of bean, to the nearest tenth percent, in order of predominance, on the gradeline of the certificate.

3.20 SOUND BEANS

Beans that are free of defects.

a. Determine sound beans on a representative portion of approximately 500 grams.

b. Record the percent of sound beans on the work record and the certificate to the nearest tenth percent.

c. When beans are graded "U.S. Substandard," record the percent of sound beans, to the nearest tenth percent, on the gradeline of the certificate.

3.21 DEFECTS

Defects for the classes Baby Lima and Miscellaneous Lima beans shall be damaged beans, contrasting classes, and foreign material. Defects for all other classes of beans shall be splits, damaged beans, contrasting classes, and foreign material.

a. For the classes Baby Lima and Miscellaneous Lima beans, determine defects by determining the sum of the percent of damaged beans, contrasting classes, and foreign material.

b. For mixed beans, determine defects by determining the sum of the percent of splits, damaged beans, and foreign material.

c. For all other classes of beans, determine defects by determining the sum of the percent of splits, damaged beans, contrasting classes, and foreign material.

d. The percent of defects cannot be shown on the work record or the certificate when only one or two of the factors defined as defects have been determined. However, when one or two factors are determined and their sum would change the numerical grade or come close to changing the grade, the other factor(s) must be determined.

e. Record the percent of defects on the work record and the certificate to the nearest tenth percent.

3.22 TOTAL DOCKAGE, DEFECTS, AND FOREIGN MATERIAL

NOTE: This factor is not provided for under the United States Standards for Beans, but may be determined upon request.

a. Compute the percent of total dockage, total defects, and foreign material as follows:

(1) Determine the weight of the work sample.

(2) Determine the weight of the dockage in the work sample (e.g., 50 grams).

(3) Calculate the percent of dockage (e.g., 50 grams ÷ 500 grams = 10 percent).

(4) Calculate the percent of dockage-free beans (e.g., 100 percent - 10 percent = 90 percent).

(5) Determine the weight of the defective beans and foreign material portion (e.g., 250 grams).

(6) Determine the weight of the defective beans and foreign material (e.g., 12.5 grams).

(7) Calculate the percentage of defective beans and foreign material (e.g., 12.5 grams ÷ 250 grams = 5 percent).

(8) Adjust the percentage of defective beans and foreign material by the base (e.g., 5 percent x 90 percent = 4.5 percent).

(9) Calculate the percentage of total dockage, defects, and foreign material (e.g., 10 percent + 4.5 percent = 14.5 percent).

b. Record the percent of “total dockage, defects, and foreign material” on the work record and the certificate to the nearest tenth percent.

3.23 SPLITS

Pieces of beans that are not damaged, each of which consists of three-fourths or less of the whole bean, and shall include any sound bean the halves of which are held together loosely.

a. Determine splits on a representative portion of approximately 500 grams.

(1) To determine whether there is a separation of the halves within the seed coat, beans that appear to be held together loosely by the seed coat shall be rolled very gently between the first finger and thumb, with the minimum amount of pressure being applied.

(2) If the halves move readily and are loose, the bean shall be considered as split.

b. Record the percent of splits on the work record and the certificate to the nearest tenth percent.

3.24 DAMAGED BEANS

Beans and pieces of beans that are damaged by frost, weather, disease, weevils/other insects, or other causes.

a. Determine damaged beans on a representative portion of approximately:

Large Lima, Baby Lima, Miscellaneous Lima, Dark Red Kidney, Light Red Kidney, Marrow, Mixed, Pea, and White Kidney beans - 500 grams;

Cranberry, Great Northern, Pinto, and Small Red beans - 375 grams;

Blackeye, Black, Flat Small White, Pink, Small White, and Yelloweye beans - 250 grams;

Mung beans - 50 grams; and

Miscellaneous beans - the same amount as is used for a class of beans of similar size and shape.

NOTE: To interpret the various types and degrees of damaged beans correctly, use the appropriate interpretive line slides (ILS). See section 3.40 for additional information about ILS.

b. The major types of damaged beans are as follows:

(1) Clean-Cut Weevil-Bored Beans. Beans and pieces of beans from which weevils have emerged, leaving a clean-cut cavity free from larvae, webbing, refuse, filth, mold, or stain. When this type of damage is suspected, split the bean to determine if the inside is also clean. (Refer to ILS - Bean 2.0.)

NOTE: Mung beans in grades U.S. Nos. 1, 2, and 3 may contain not more than 0.1, 0.2, and 0.5 percent, respectively, of clean-cut weevil-bored beans.

(2) Dirt and Grime Damaged Beans. Beans (other than Pea beans) and pieces of beans with dirt or grime adhering to the seed coat equal to or greater than that shown on ILS - Bean 3.1. The dirt or grime may be confined to one side or a combination of both sides. Smaller dirt spots (but not grimy areas) may be combined to equal the ILS. (For dirt and grime damaged "pieces of beans," refer to ILS - Bean 13.0.)

NOTE: The percent of Pea beans with a significant amount of dirt or grime adhering to their seed coat may be determined upon request. The results of this determination shall be shown in the Remarks section of the official bean certificate. These results shall not, however, be used to determine the grade of the Pea beans. (Refer to ILS - Bean 3.0, "Dirt and Grime Affected Pea Beans (Not Damage).")

(3) Frost Damaged Beans. Beans and pieces of beans which have been damaged by frost to the extent that the cotyledon has been discolored. Frost damage is indicated by the appearance of the whole bean; but the actual determination for damage shall be made on the basis of the opened bean, the discoloration shall be equal to or greater than that shown on ILS - Bean 4.0.

(4) Insect Stung Beans. Beans and pieces of beans which are distinctly damaged by weevils or other insects.

(a) Blackeye Beans. Beans and pieces of blackeye beans that have any of the following: Two or more stings that extend into the cotyledon; a single severe sting extending into the cotyledon with discoloration equal to or greater than the amount shown on ILS - Bean 6.0; or a chalky-spot equal to or greater than that shown on ILS - Bean 6.0. (Carefully remove seed coat to determine size of spot when applicable.)

(b) Beans Other than Blackeye Beans (including cowpeas). Beans and pieces of beans that have any of the following: One severe sting (not required to extend into the cotyledon) with discoloration equal to or greater than the amount shown on ILS - Bean 6.1 or two or more stings extending into the cotyledon. (Carefully remove seed coat to determine size of spot when applicable.)

NOTE: No further examination (removal of the seed coat) is required when there is only a single sting. However, occasionally it may be necessary to remove the seed coat from beans that have several small stings to determine if penetration of the cotyledon has occurred.

(5) Machine Damaged Beans. Beans and pieces of beans that are either cut or scraped due to handling, which contain dirt or grime on the cotyledon equal to or greater than that shown on ILS - Bean 15.0.

(6) Mold Damaged Beans. Beans and pieces of beans which contain mold equal to or greater than that shown on ILS - Bean 9.0. Mold may appear on or around the hilum, the surface, or the cotyledon.

NOTE: Closely examine any bean that evidences signs of internal mold damage. But, do not scrape or split any bean that appears (externally) to be sound. The presence of mold in some splits should not be considered to be sufficient justification for opening all beans in the sample.

(7) Nightshade Damaged Beans. Beans and pieces of beans containing nightshade juice causing dirt and other matter to adhere to the seed coat equal to or greater than that shown on ILS - Bean 10.0. Beans affected by bag markings/ink stains shall also be considered to be damaged if the discoloration is equal to or greater than that shown on ILS - Bean 10.0 or ILS Bean - 12.0.

(8) Sprout Damaged Beans. Beans and pieces of beans which are sprouted in which the sprout is equal to or greater than that shown on ILS - Bean 11.0.

(9) Visible Window Damaged Beans. Beans and pieces of beans which are weevil-bored, but the weevil has not emerged from the bean. A "window" of seed coat covers the bore hole. The bean may contain a live or dead weevil. (Refer to ILS - Bean 2.1, "Visible Window Damaged Beans.")

NOTE: Beans that contain two or more "visible window damaged beans," are considered to be contaminated by insect webbing or filth, and shall be graded "U.S. Sample grade."

(10) Water Blistered Damaged Beans. Beans and pieces of beans which are damaged by water and have discoloration of the seed coat equal to or greater than that shown on ILS - Bean 12.0. ("Tiger-striped" beans shall not be considered as damaged-see ILS - Bean 12.1.) For Blackeye beans, use the Pea bean on the ILS as a guide in determining discoloration and use the Pinto bean as a guide to determining area of coverage.

(11) Worm-Eaten Beans or Worm-Cut Beans. Beans and pieces of beans which have been chewed by insect larvae, not to be confused with clean-cut weevil-bored beans or weevil-bored beans containing insect webbing or filth. Any chewed bean is considered damaged. (Refer to ILS - Bean 8.0.)

NOTE 1: Small underdeveloped or shriveled beans, broken beans, or beans with cracked seed coats shall not be considered as damaged beans unless otherwise damaged.

NOTE 2: Blistered, wrinkled, or broken beans in the classes Large Lima, Baby Lima, and Miscellaneous Lima beans shall not be considered as damaged beans unless otherwise damaged. Specific limits for these factors are provided in the grade requirements for each particular class.

c. Record the percent of damaged beans on the work record and the certificate to the nearest tenth percent.

3.25 BADLY DAMAGED BEANS

Beans and pieces of beans that are materially damaged or discolored by frost, weather, disease, weevils or other insects, or other causes so as to materially affect the appearance and quality of the beans.

NOTE: This factor is applicable only to classes Large Lima, Baby Lima, Miscellaneous Lima, and Pea beans.

a. Determine badly damaged beans on a representative portion of approximately 500 grams.

b. Badly damaged beans are beans and pieces of beans that are materially damaged or discolored to the extent that it affects the appearance and the quality of the bean. Damage must be visible from any position or angle. (Refer to ILS - Bean 1.0.)

c. Record the percent of badly damaged beans on the work record and the certificate to the nearest tenth percent.

3.26 FOREIGN MATERIAL (INCLUDING STONES)

Foreign material shall be stones, dirt, weed seed, cereal grains, lentils, peas, and all matter other than beans.

Stones shall be concreted earthy or mineral matter, and other substances of similar hardness that do not disintegrate readily in water.

NOTE: Beans which contain significant quantities of foreign material that can be removed readily by ordinary cleaning processes are considered as "not well screened" and shall be graded "U.S. Substandard" for this reason.

a. Determine foreign material (including stones) on a representative portion of approximately 500 grams.

b. Except for Pea beans, record the percent of foreign material (total) and stones on the work record and the certificate to the nearest tenth percent. As a rule of thumb:

(1) For Pea beans that contain 0.05 percent or more of foreign material (total) or stones, record the percent of foreign material (total) and stones on the work record and the certificate to the nearest tenth percent.

(2) For Pea beans that contain less than 0.05 percent of foreign material (total) or stones, record the percent of foreign material (total) and stones on the work record and the certificate to the nearest hundredth percent.

3.27 BLISTERED, WRINKLED, AND BROKEN BEANS

Blistered beans shall be sound beans with badly blistered or burst seed coats.

Wrinkled beans shall be sound beans that have deeply wrinkled seed coats and/or are badly warped or misshapen.

Broken beans shall be sound beans with some but less than one-fourth of each bean broken off or with one-fourth or more of the seed coat removed.

NOTE: This factor is applicable to the classes Large Lima, Baby Lima, and Miscellaneous Lima beans only.

a. Determine blistered, wrinkled, and broken beans on a representative portion of approximately 500 grams.

(1) Sound beans that have a cracked or split seed coat that extends over the eye of the bean and part way down the sides and exposes the cotyledon one-half the way down both sides and over the eye, or is accompanied by other extensive breaks in the seed coat, shall be considered as blistered beans.

(2) Sound beans that have deep wrinkles in the seed coat which extends at least halfway into the cotyledon shall be considered as wrinkled beans.

(3) Sound beans that are warped or misshapen to the extent that they materially affect the appearance of a lot shall be considered as wrinkled beans.

b. For Baby Lima and Miscellaneous Lima beans, record the percent of blistered, wrinkled, and broken beans on the work record and the certificate to the nearest tenth percent.

c. For Large Lima beans:

(1) Record the percent of broken beans on the work record and the certificate to the nearest tenth percent.

(2) Record the percent of blistered and wrinkled beans on the work record to the nearest tenth percent.

(3) Add the percent of blistered and wrinkled beans to the percent of defects, and record the total on the work record and the certificate to the nearest tenth percent.

3.28 NOT WELL SCREENED

Well screened, as applicable to the general appearance of beans, shall mean that the beans are uniform in size and are practically free from such small, shriveled, undeveloped beans, splits, broken beans, large beans, and foreign material that can be removed readily by the ordinary process of milling or screening through the proper use of sieves.

a. Determine not well screened on the basis of the work sample as a whole.

(1) Absolute uniformity in size is neither necessary nor practicable. But, the presence of shriveled, undersized, immature or underdeveloped beans gives an uneven appearance and indicates that the beans have not been submitted to the ordinary cleaning and screening operation.

(2) The term "well screened," as applied to the general appearance of beans, generally describes the practical limits of uniformity in size. Small, undeveloped beans of any class which obviously are the result of a clean out or screening process, regardless of uniformity of size, shall be considered as not well screened.

(3) Mixtures of more than 5.0 percent of very small, shrunken, or undersized reclaimed beans of any class, with other normal-sized beans of the class, shall cause the mixture to be considered as "not well screened" when such mixtures obviously are of such character that the quality is not properly reflected in the numerical grade.

(4) Any beans which meet the requirements for grades U.S. Choice Handpicked Pea bean, U.S. Prime Handpicked Pea beans, U.S. Nos. 1, 2, or 3 on account of foreign material and stones may generally be considered as being well screened. However, when the foreign material is of a character that could have been readily screened out, the beans may be considered as not well screened even though the amount of foreign material is within the limit allowed in the above-mentioned grades.

b. When applicable, show the term "Not well screened" on the work record and in the Remarks section of the certificate, and grade the beans no higher than "U.S. Substandard."

3.29 SIZE

A 28/64 sieve shall be a metal sieve 0.0619-inch thick perforated with round holes 0.4675 (28/64) inch in diameter which are 19/62 inch from center to center. The perforations of each row shall be staggered in relation to the adjacent row.

A 24/64 sieve shall be a metal sieve 0.0619-inch thick perforated with round holes 0.6750 (24/64) inch in diameter which are 17/62 inch from center to center. The perforations of each row shall be staggered in relation to the adjacent row.

NOTE: This factor is applicable to the class Large Lima beans only.

a. Determine size on a representative portion of approximately 500 grams.

(1) Nest a 28/64 sieve and a 24/64 sieve in a bottom pan (28/64 sieve on top).

(2) If an FGIS-approved mechanical sizer is used:

(a) Place the sieves in the sizer holder and set the timer to 20.

(b) Put the beans in the center of the top sieve and actuate the sizer.

(3) If the beans are to be sieved by hand:

(a) Put the beans in the center of the top sieve and hold the sieves and bottom pan level in both hands directly in front of the body with the elbows close to the side.

(b) In a steady sieving motion, move the sieve from right to left approximately 10 inches and return from left to right to complete the operation.

(c) Repeat the complete operation 20 times.

b. Record the percent of beans that passed through the 28/64 sieve and the percent of beans that passed through the 24/64 sieve on the work record and the certificate to the nearest tenth percent.

3.30 SEED COUNT

NOTE: This factor is not provided for under the United States Standards for Beans, but may be determined upon request.

a. Determine seed count (i.e., the number of beans per ounce) on a representative portion of exactly 141.9 grams of beans after the removal of defects and foreign material.

b. Count the beans in the portion, divide the results by 5, and then round the number to the nearest whole number.

c. Show the statement "(rounded whole number) beans per ounce." on the work and the certificate.

3.31 CHECKED SEED COATS

NOTE: This factor is not provided for under the United States Standards for Beans, but may be determined upon request.

a. Determine checked seed coat (i.e., partially detached) on a representative portion of approximately 125 grams of beans after the removal of defects and foreign material.

b. Place the beans in a shallow container and completely cover them with tap water.

c. Allow the beans to soak for 5 minutes and then pour off the water. Let the beans air-dry for one minute on a paper towel. Weigh the "drained bean" portion.

d. Pick out the beans with checked seed coats, weigh the separation, and then divide it by the weight of the "drained bean" portion.

e. Record the percent of checked seed coats on the work record and the certificate to the nearest tenth percent.

3.32 OFF-COLOR

Beans that are distinctly off-color due to age or any other natural causes but are not materially weathered shall be graded "off-color."

a. Determine off-color on a representative portion of approximately 500 grams after the removal of total defects.

(1) Beans shall be considered as "off-color" if they are not of a good natural color or are stained to an extent that they seriously affect the appearance of the lot.

(2) Beans that are discolored by dust or a slight amount of dirt, which can be removed by processing methods, shall not be considered as "off-color."

b. When applicable, show the term "Off-color" on the work record and the certificate.

3.33 MATERIALLY WEATHERED BEANS

a. Determine materially weathered on the basis of the work sample as a whole.

(1) Weathering is caused by exposure of the beans to adverse weather conditions, such as prolonged rains or snow.

(2) Materially weathered beans are badly discolored, often with severely cracked or rough seed coats.

b. When applicable, show the term "Materially weathered" on the work record and in the Remarks section of the certificate, and grade the beans "U.S. Sample grade."

3.34 INSECT WEBBING OR FILTH

a. Determine insect webbing and filth on the basis of the representative sample as a whole.

(1) The presence of two or more beans containing insect webbing or filth (refuse, excreta, or dead insects or larvae, including house flies) in a work sample shall be considered sufficient evidence of insect webbing or filth. (If less than 1,000 grams is available, the presence of one bean containing insect webbing or filth in a 500-gram representative portion shall be considered sufficient evidence of insect webbing or filth.)

(2) One bean containing insect webbing or filth in the work sample and any bean containing insect webbing or filth in the file sample shall be considered sufficient evidence of insect webbing or filth.

(3) The presence of two or more dead insects in a 500-gram representative portion shall be considered sufficient evidence of insect webbing or filth.

b. When applicable, show the term "Insect webbing or filth" on the work record and in the Remarks section of the certificate, and grade the beans "U.S. Sample grade."

3.35 ANIMAL FILTH

a. Determine animal filth on the basis of the representative sample as a whole.

(1) The presence of two or more rodent or bird pellets in a work sample shall be considered sufficient evidence of animal filth.

(2) One pellet in the work sample and any pellets in the file sample shall be considered sufficient evidence of animal filth.

b. When applicable, show the term "Animal filth" on the work record and in the Remarks section of the certificate, and grade the beans "U.S. Sample grade."

3.36 UNKNOWN FOREIGN SUBSTANCE

a. Determine unknown foreign substance on the basis of the representative sample as a whole.

(1) The presence of two or more particles of an unknown foreign substance, including rock salt or other crystalline substances, or a commonly recognized harmful or toxic substance, including so-called "pink beans" (beans treated with mercury or panagin), in a work sample shall be sufficient evidence of unknown foreign substance.

(2) One particle of an unknown foreign substance or one treated bean in a work sample and any other particle or treated bean in the file sample shall be sufficient evidence of unknown foreign substance.

b. When applicable, show the term "Unknown foreign substance" on the work record and in the Remarks section of the certificate, and grade the beans "U.S. Sample grade."

3.37 BROKEN GLASS

a. Determine broken glass on the basis of the representative sample as a whole or the lot as a whole.

b. The presence of any broken glass, regardless of the size or amount, in a representative sample or in the lot shall be sufficient evidence of broken glass.

c. When applicable, show the term "Broken glass" on the work record and in the Remarks section of the certificate, and grade the beans "U.S. Sample grade."

3.38 METAL FRAGMENTS

a. Determine metal fragments on the basis of the representative sample as a whole or the lot as a whole.

(1) The presence of two or more metal fragments, such as filings or shavings, in a work sample or in the lot shall be sufficient evidence of metal fragments.

(2) One metal fragment in a work sample and any metal fragment in the file sample shall be sufficient evidence of metal fragments.

b. When applicable, show the term “Metal fragments” on the work record and in the Remarks section of the certificate, and grade the beans “U.S. Sample grade.”

3.39 DISTINCTLY LOW QUALITY

a. Determine distinctly low quality on the basis of the representative sample as a whole or the lot as a whole.

b. Beans that are obviously affected by unusual conditions which adversely affect the quality of the beans and which cannot be graded properly by use of the grading factors specified or defined in the standards shall be considered as being of distinctly low quality.

c. When applicable, show the statement “Distinctly low quality on account of (cause or reason).” on the work record and in the Remarks section of the certificate, and grade the beans “U.S. Sample grade.”

3.40 INTERPRETIVE LINE SLIDES

The interpretive line slide system assists inspectors in making subjective grading decisions. This system consists of a portable tabletop transparency viewer and photographic slide transparencies. The viewer uses a precisely controlled light source of low intensity designed to provide a standard picture and to protect the slide. Therefore, only use the special viewer for ILS. Other light sources, such as a regular slide projector, may provide a distorted picture and damage the ILS. Use of such a projector is not prohibited; but, once used in this manner, the slides may not be used for official purposes.

Table 3
Currently Available Interpretive Line Slides

BEAN 1.0	BADLY DAMAGED BEANS
BEAN 2.0	CLEAN CUT WEEVIL BORED BEANS
BEAN 2.1	VISIBLE WINDOW DAMAGED (WEEVIL) BEAN
BEAN 3.0	DIRT AND GRIME AFFECTED PEA BEANS
BEAN 3.1	DIRT AND GRIME DAMAGED (NOT PEA BEANS)
BEAN 4.0	FROST DAMAGED BEANS
BEAN 6.0	INSECT STUNG DAMAGE (BLACKEYE)
BEAN 6.1	INSECT STUNG DAMAGE
BEAN 6.2	INSECT STUNG DAMAGE (WHITE BEANS)
BEAN 7.0	INSECT WEBBING AND FILTH
BEAN 8.0	WORM EATEN DAMAGED BEANS
BEAN 9.0	MOLD DAMAGED BEANS
BEAN 10.0	NIGHTSHADE DAMAGED BEANS
BEAN 11.0	SPROUT DAMAGED BEANS
BEAN 12.0	WATER BLISTERED DAMAGED BEANS
BEAN 12.1	TIGER STRIPE BEANS (NOT DAMAGED)
BEAN 12.2	WATER BLISTERED DAMAGED BEANS
BEAN 13.0	DAMAGED (PIECES)
BEAN 14.0	RESPIRATION DAMAGED BEANS
BEAN 15.0	MACHINE DAMAGED

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GRADES AND GRADE REQUIREMENTS FOR BEANS

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TABLE 1 - PEA BEANS

GRADE	Maximum limits of-- Moisture [1/] (%)	Total defects (DK, FM, CCL, & SPL) (%)	Badly damaged (%)	Foreign Material Total (%)	Foreign Material Stones (%)
U.S. Choice Handpicked [4/]	18.0	1.5	0.3	0.01	0.01
U.S. Prime Handpicked [4/]	18.0	3.0	0.3	0.01	0.01
U.S. No. 1 [5/]	18.0	2.0	2.0	0.4	0.2
U.S. No. 2 [5/]	18.0	3.0	3.0	0.8	0.4

GRADE	Maximum limits of-- Contrasting classes [2/] (%)	Classes that blend [3/] (%)
U.S. Choice Handpicked [4/]	0.01	2.0
U.S. Prime Handpicked [4/]	0.01	2.0
U.S. No. 1 [5/]	0.5	4.0
U.S. No. 2 [5/]	1.0	4.0

U.S. Substandard [5/] — U.S. Substandard shall be beans which do not meet the requirements for the grades U.S. Choice Handpicked through U.S. No. 2 or U.S. Sample grade. Beans which are not well screened shall also be U.S. Substandard, except for beans which meet the requirements for U.S. Sample grade.

U.S. Sample grade [5/] — U.S. Sample grade shall be beans which are musty, sour, heating, materially weathered, or weevily; which have any commercially objectionable odor; which contain insect webbing or filth, animal filth, any unknown foreign substance, broken glass, or metal fragments; or which are otherwise of distinctly low quality.

1/ Beans with more than 18.0 percent moisture are graded High moisture.
2/ Beans with more than 2.0 percent contrasting classes are graded Mixed beans.
3/ Beans with more than 15.0 percent classes that blend are graded Mixed beans.
4/ Beans of this grade may not grade “Off-color.”
5/ The Special grade “Off-color” may be applied after the removal of total defects.

TABLE 2 - BLACKEYE BEANS

GRADE	Maximum limits of--				
	Moisture [1/] (%)	Total defects (DK, FM, CCL, & SPL) (%)	Total damaged (%)	Foreign Material	
				Total (%)	Stones (%)
U.S. No. 1 [4/]	18.0	4.0	2.0	0.5	0.2
U.S. No. 2 [4/]	18.0	6.0	4.0	1.0	0.4
U.S. No. 3 [4/]	18.0	8.0	6.0	1.5	0.6

GRADE	Maximum limits of--	
	Contrasting classes [2/] (%)	Classes that blend [3/] (%)
U.S. No. 1 [4/]	0.5	5.0
U.S. No. 2 [4/]	1.0	10.0
U.S. No. 3 [4/]	2.0	15.0

U.S. Substandard [4/] — U.S. Substandard shall be beans which do not meet the requirements for the grades U.S. No. 1 through U.S. No. 3 or U.S. Sample grade. Beans which are not well screened shall also be U.S. Substandard, except for beans which meet the requirements for U.S. Sample grade.

U.S. Sample grade [4/] — U.S. Sample grade shall be beans which are musty, sour, heating, materially weathered, or weevily; which have any commercially objectionable odor; which contain insect webbing or filth, animal filth, any unknown foreign substance, broken glass, or metal fragments; or which are otherwise of distinctly low quality.

1/ Beans with more than 18.0 percent moisture are graded High moisture.
2/ Beans with more than 2.0 percent contrasting classes are graded Mixed beans.
3/ Beans with more than 15.0 percent classes that blend are graded Mixed beans.
4/ The Special grade “Off-color” may be applied after the removal of total defects.

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TABLE 3 - YELLOWEYE BEANS

GRADE	Maximum limits of-- Moisture [1/] (%)	Total defects (DK, FM, CCL, & SPL) (%)	Total damaged (%)	Foreign Material Total (%)	Foreign Material Stones (%)
U.S. No. 1 [4/]	18.0	4.0	2.0	0.5	0.2
U.S. No. 2 [4/]	18.0	6.0	4.0	1.0	0.4
U.S. No. 3 [4/]	18.0	8.0	6.0	1.5	0.6

GRADE	Maximum limits of-- Contrasting classes [2/] (%)	Classes that blend [3/] (%)	In addition to classes that blend, white beans similar in size and shape in the class Yelloweye beans (%)
U.S. No. 1 [4/]	0.5	5.0	5.0
U.S. No. 2 [4/]	1.0	10.0	5.0
U.S. No. 3 [4/]	2.0	15.0	---

U.S. Substandard [4/] — U.S. Substandard shall be beans which do not meet the requirements for the grades U.S. No. 1 through U.S. No. 3 or U.S. Sample grade. Beans which are not well screened shall also be U.S. Substandard, except for beans which meet the requirements for U.S. Sample grade.

U.S. Sample grade [4/] — U.S. Sample grade shall be beans which are musty, sour, heating, materially weathered, or weevily; which have any commercially objectionable odor; which contain insect webbing or filth, animal filth, any unknown foreign substance, broken glass, or metal fragments; or which are otherwise of distinctly low quality.

1/ Beans with more than 18.0 percent moisture are graded High moisture.
2/ Beans with more than 2.0 percent contrasting classes are graded Mixed beans.
3/ Beans with more than 15.0 percent classes that blend are graded Mixed beans.
4/ The Special grade “Off-color” may be applied after the removal of total defects.

TABLE 4 - CRANBERRY BEANS

GRADE	Maximum limits of-- Moisture [1/] (%)	Total defects (DK, FM, CCL, & SPL) (%)	Total damaged (%)	Foreign Material Total (%)	Foreign Material Stones (%)
U.S. No. 1 [4/]	18.0	4.0	2.0	0.5	0.2
U.S. No. 2 [4/]	18.0	6.0	4.0	1.0	0.4
U.S. No. 3 [4/]	18.0	8.0	6.0	1.5	0.6

GRADE	Maximum limits of-- Contrasting classes [2/] (%)	Classes that blend [3/] (%)
U.S. No. 1 [4/]	0.5	5.0
U.S. No. 2 [4/]	1.0	10.0
U.S. No. 3 [4/]	2.0	15.0

U.S. Substandard [4/] — U.S. Substandard shall be beans which do not meet the requirements for the grades U.S. No. 1 through U.S. No. 3 or U.S. Sample grade. Beans which are not well screened shall also be U.S. Substandard, except for beans which meet the requirements for U.S. Sample grade.

U.S. Sample grade [4/] — U.S. Sample grade shall be beans which are musty, sour, heating, materially weathered, or weevily; which have any commercially objectionable odor; which contain insect webbing or filth, animal filth, any unknown foreign substance, broken glass, or metal fragments; or which are otherwise of distinctly low quality.

1/ Beans with more than 18.0 percent moisture are graded High moisture.
2/ Beans with more than 2.0 percent contrasting classes are graded Mixed beans.
3/ Beans with more than 15.0 percent classes that blend are graded Mixed beans.
4/ The Special grade “Off-color” may be applied after the removal of total defects.

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TABLE 5 - PINTO BEANS

GRADE	Maximum limits of-- Moisture [1/] (%)	Total defects (DK, FM, CCL, & SPL) (%)	Total damaged (%)	Foreign Material Total (%)	Foreign Material Stones (%)
U.S. No. 1 [4/]	18.0	3.0	3.0	0.5	0.2
U.S. No. 2 [4/]	18.0	5.0	5.0	1.0	0.4
U.S. No. 3 [4/]	18.0	7.0	7.0	1.5	0.6

GRADE	Maximum limits of-- Contrasting classes [2/] (%)	Classes that blend [3/] (%)
U.S. No. 1 [4/]	0.5	5.0
U.S. No. 2 [4/]	1.0	10.0
U.S. No. 3 [4/]	2.0	15.0

U.S. Substandard [4/] — U.S. Substandard shall be beans which do not meet the requirements for the grades U.S. No. 1 through U.S. No. 3 or U.S. Sample grade. Beans which are not well screened shall also be U.S. Substandard, except for beans which meet the requirements for U.S. Sample grade.

U.S. Sample grade [4/] — U.S. Sample grade shall be beans which are musty, sour, heating, materially weathered, or weevily; which have any commercially objectionable odor; which contain insect webbing or filth, animal filth, any unknown foreign substance, broken glass, or metal fragments; or which are otherwise of distinctly low quality.

1/ Beans with more than 18.0 percent moisture are graded High moisture.
2/ Beans with more than 2.0 percent contrasting classes are graded Mixed beans.
3/ Beans with more than 15.0 percent classes that blend are graded Mixed beans.
4/ The Special grade “Off-color” may be applied after the removal of total defects.

TABLE 6 - MARROW, GREAT NORTHERN, SMALL WHITE, FLAT SMALL WHITE, WHITE KIDNEY, LIGHT RED KIDNEY, DARK RED KIDNEY, SMALL RED, PINK, BLACK, AND MISCELLANEOUS BEANS

GRADE	Maximum limits of--				
	Moisture [1/] (%)	Total defects (DK, FM, CCL, & SPL) (%)	Total damaged (%)	Foreign Material	
				Total (%)	Stones (%)
U.S. No. 1 [4/]	18.0	2.0	2.0	0.5	0.2
U.S. No. 2 [4/]	18.0	4.0	4.0	1.0	0.4
U.S. No. 3 [4/]	18.0	6.0	6.0	1.5	0.6

GRADE	Maximum limits of--	
	Contrasting classes [2/] (%)	Classes that blend [3/] (%)
U.S. No. 1 [4/]	0.5	5.0
U.S. No. 2 [4/]	1.0	10.0
U.S. No. 3 [4/]	2.0	15.0

U.S. Substandard [4/] — U.S. Substandard shall be beans which do not meet the requirements for the grades U.S. No. 1 through U.S. No. 3 or U.S. Sample grade. Beans which are not well screened shall also be U.S. Substandard, except for beans which meet the requirements for U.S. Sample grade.

U.S. Sample grade [4/] — U.S. Sample grade shall be beans which are musty, sour, heating, materially weathered, or weevily; which have any commercially objectionable odor; which contain insect webbing or filth, animal filth, any unknown foreign substance, broken glass, or metal fragments; or which are otherwise of distinctly low quality.

1/ Beans with more than 18.0 percent moisture are graded High moisture.
2/ Beans with more than 2.0 percent contrasting classes are graded Mixed beans.
3/ Beans with more than 15.0 percent classes that blend are graded Mixed beans.
4/ The Special grade “Off-color” may be applied after the removal of total defects.

TABLE 7 - MUNG BEANS

GRADE	Maximum limits of-- Moisture [1/] (%)	Total defects (DK, FM, CCL, & SPL) (%)	Total damaged (%)	Clean cut weevil bored [2/] (%)	Foreign Material Total (%)	Foreign Material Stones (%)
U.S. No. 1 [5/]	18.0	2.0	2.0	0.1	0.5	0.2
U.S. No. 2 [5/]	18.0	4.0	4.0	0.2	1.0	0.4
U.S. No. 3 [5/]	18.0	6.0	6.0	0.5	1.5	0.6

GRADE	Maximum limits of-- Contrasting classes [3/] (%)	Classes that blend [4/] (%)
U.S. No. 1 [5/]	0.5	5.0
U.S. No. 2 [5/]	1.0	10.0
U.S. No. 3 [5/]	2.0	15.0

U.S. Substandard [5/] — U.S. Substandard shall be beans which do not meet the requirements for the grades U.S. No. 1 through U.S. No. 3 or U.S. Sample grade. Beans which are not well screened shall also be U.S. Substandard, except for beans which meet the requirements for U.S. Sample grade.

U.S. Sample grade [5/] — U.S. Sample grade shall be beans which are musty, sour, heating, materially weathered, or weevily; which have any commercially objectionable odor; which contain insect webbing or filth, animal filth, any unknown foreign substance, broken glass, or metal fragments; or which are otherwise of distinctly low quality.

1/ Beans with more than 18.0 percent moisture are graded High moisture.
2/ Beans with more than 0.5 percent clean cut weevil bored beans are graded U.S. Sample grade.
3/ Beans with more than 2.0 percent contrasting classes are graded Mixed beans.
4/ Beans with more than 15.0 percent classes that blend are graded Mixed beans.
5/ The Special grade “Off-color” may be applied after the removal of total defects.

TABLE 8 - LARGE LIMA BEANS

GRADE	Maximum limits of-- Moisture [1/] (%)	Total blistered, wrinkled, & defects (%)	Damaged Beans Total (%)	Damaged Beans Badly damaged (%)	Foreign Material Total (%)	Foreign Material Stones (%)
U.S. No. 1 [4/]	18.0	6.0	2.0	0.5	0.5	0.2
U.S. No. 2 [4/]	18.0	9.0	3.0	1.0	1.0	0.3

GRADE	Maximum limits of-- Contrasting classes [2/] (%)	Splits (%)	Broken (%)	Classes that blend [3/] (%)	Beans Through 28/64" (%)	Beans Through 24/64" (%)
U.S. No. 1 [4/]	0.5	3.0	5.0	5.0	25.0	5.0
U.S. No. 2 [4/]	1.0	5.0	5.0	10.0	40.0	5.0

U.S. Substandard [4/]

U.S. Substandard shall be beans which do not meet the requirements for the grades U.S. No. 1 through U.S. No. 2 or U.S. Sample grade. Beans which are not well screened shall also be U.S. Substandard, except for beans which meet the requirements for U.S. Sample grade.

U.S. Sample grade [4/]

U.S. Sample grade shall be beans which are musty, sour, heating, materially weathered, or weevily; which have any commercially objectionable odor; which contain insect webbing or filth, animal filth, any unknown foreign substance, broken glass, or metal fragments; or which are otherwise of distinctly low quality.

1/ Beans with more than 18.0 percent moisture are graded High moisture.
2/ Beans with more than 2.0 percent contrasting classes are graded Mixed beans.
3/ Beans with more than 15.0 percent classes that blend are graded Mixed beans.
4/ The Special grade “Off-color” may be applied after the removal of total defects.

TABLE 9 - BABY LIMA AND MISCELLANEOUS LIMA BEANS

GRADE	Maximum limits of--				
		Total defects (DK, FM & CCL)	Badly damaged	Foreign Material	
	Moisture [1/] (%)	(%)	(%)	Total (%)	Stones (%)
U.S. No. 1 [4/]	18.0	2.0	1.0	0.5	0.2
U.S. No. 2 [4/]	18.0	4.0	1.5	1.0	0.3
U.S. No. 3 [4/]	18.0	6.0	2.0	1.5	0.6

GRADE	Maximum limits of--			
	Contrasting classes [2/] (%)	Classes that blend [3/] (%)	Splits (%)	Blistered, wrinkled, and/or broken (%)
U.S. No. 1 [4/]	0.5	5.0	2.0	2.0
U.S. No. 2 [4/]	1.0	10.0	4.0	4.0
U.S. No. 3 [4/]	2.0	15.0	6.0	6.0

U.S. Substandard [4/] — U.S. Substandard shall be beans which do not meet the requirements for the grades U.S. No. 1 through U.S. No. 3 or U.S. Sample grade. Beans which are not well screened shall also be U.S. Substandard, except for beans which meet the requirements for U.S. Sample grade.

U.S. Sample grade [4/] — U.S. Sample grade shall be beans which are musty, sour, heating, materially weathered, or weevily; which have any commercially objectionable odor; which contain insect webbing or filth, animal filth, any unknown foreign substance, broken glass, or metal fragments; or which are otherwise of distinctly low quality.

1/ Beans with more than 18.0 percent moisture are graded High moisture.
2/ Beans with more than 2.0 percent contrasting classes are graded Mixed beans.
3/ Beans with more than 15.0 percent classes that blend are graded Mixed beans.
4/ The Special grade “Off-color” may be applied after the removal of total defects.